

PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in Press Jaws

We, E. S. & A. ROBINSON LIMITED, a Company organised according to the laws of Great Britain, and Northern Ireland, and KENNETH WILLIAM DAVIES, JOHN NICHOLAS, and DONALD CHARLES BAKER, all British Subjects, and all of the Company's address, 1, Redcliff Street, Bristol, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to presses for sealing together materials under the influence of heat and pressure.

It is known to produce a paper bag in which adhesion between those parts of the surfaces previously treated with a coating of a thermoplastic substance is effected by means of a hot press. To produce a simple paper bag the adhesion can be effected by pressing the bag in a heated press having plain jaws.

20 In a bag formed with gussets, as in the type known as a satchel bag, there are differences in the thickness of the bag at different points. Hitherto the hot presses used for heat sealing a bag of this type have employed solid jaws engraved with a pattern, the design of one fitting into the other. With this type of press it is impossible to secure an even pressure on the bag unless special jaws are made for each type, size and shape of bag.

It is an object of the present invention to provide a jaw for a press capable of exerting an equal pressure on the whole of a surface having minor irregularities of form.

According to the present invention a jaw for a press is made up of a number of separate elements in such a way as to allow for a slight relative movement between the elements so that the operative face of the jaw can accommodate itself to a surface having minor irregularities of form and exert a substantially even pressure. Heating means may be incorporated in said jaw.

Said jaw may be of laminated form, the laminations consisting of blades of equal length butting on an encased block

of rubber or like plastic substance and a second set of blades of equal length, operatively associated with an incorporated heating means, one end of said second set of blades being adapted to act as the operative face of the jaw and the other end of said second set being adapted to butt against the end of said first set of blades. Means may be incorporated for separating said first set of blades from said second set when said jaw is not under pressure.

In one embodiment of the present invention, a press for the heat sealing of paper bags and the like is constructed with one plain heatable jaw and one jaw capable of exerting pressure substantially equal over a surface having minor irregularities of form, hereinafter called a variable jaw.

The variable jaw comprises an outer casing, consisting of a steel end plate and sides built up of laminae of steel plates and sheets of insulating material a fixed rear inner case open at both ends containing a set of thin metal plates butting at one end against a rubber pad which abuts the end plate of the outer casing and closes the end of the rear inner case, being thus encased on five sides.

The set of thin metal plates is positioned by a retaining rod which passes through a slot formed in them, thus permitting a limited longitudinal movement to the blades individually relative to each other. A forward inner case forms a sliding fit inside the outer case, being permitted a limited movement therein. In the forward inner case are contained a second set of plates, one end of which act as the operative face of the jaw and the other end of which are adapted to abut against the free end of the set of plates contained in the rear inner case when the press is in use.

The forward set of plates are positioned by a retaining rod located in a slot formed in the plates. The retaining rod extends through the forward inner case.

[Price 2/-]

and engages with a slot formed in the outer case and thus limits the travel of the forward inner case. The forward set of plates is formed with a second slot through which a cartridge type electric heating element extends.

In other forms of this type of sealer the laminations may be heated by elements fitted in the forward retaining case.

Four compression springs are located between the edges of the forward and rear inner cases and keep the cases apart when the jaw is not under pressure. This prevents a loss of heat by conduction from the front inner case to the rear inner case and undue transmission of heat to the rubber pad.

About the outer ends of the heating element are fitted insulated eyelets, which are attached to tension springs, attached at their other ends to pegs, fitted into holes formed in the rear part of the outer casing. The element is kept in contact with all the laminae of the forward set by the operation of these springs, when the jaw is not under pressure.

The operation of the press depends on the principle known as rubber hydraulics; that is, for very small linear displacements, rubber will act substantially as a fluid.

In operation the bag, which is to be heat sealed is placed between the jaws of the press, which are then brought together. As the plain jaw and the variable jaw come into contact with the bag the plates in the front set conform to the contour of the bag; those plates which are in contact with the thickest portions of the bag receiving the largest displacements. Further relative movement of the jaws forces the plates of the front set into contact with the plates in the rear set which abut against the rubber pad. Those plates which have received the largest displacement come into contact with the rubber first. Owing to the plasticity of the rubber the plates force the surface of the rubber backward and, being encased, the displaced rubber exudes round the edges of the plates and comes into contact with and causes a pressure on the ends of the plates, which have received a lesser displacement. In this way a substantially uniform pressure is exerted on each of the plates and thus transmitted to the jaws to equalise the pressure at all parts of the operative face.

Dated this 18th day of February, 1947.

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Chartered Patent Agents.

COMPLETE SPECIFICATION

Improvements in Press Jaws

We, E. S. & A. ROBINSON LIMITED, a Company organised according to the laws of Great Britain, and Northern Ireland, and KENNETH WILLIAM DAVIES, JOHN NICHOLAS, and DONALD CHARLES BAKER, all British Subjects, and all of the Company's address, 1, Redcliff Street, Bristol, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to presses for applying a substantially equal pressure on a surface having minor irregularities of form and is of particular use in relation to presses for sealing together materials under the influence of heat and pressure.

It is known to produce a paper bag in which adhesion between parts of the surfaces previously treated with a coating of a thermoplastic substance is effected by means of a hot press. To produce a simple paper bag the adhesion can be effected by pressing the bag in a press having plain heated jaws.

In a bag formed with gussets, as in the type known as a satchel bag, there are differences in the thickness of the bag at different points. Hitherto the hot-presses used for heat sealing a bag of this type have employed solid heatable jaws engraved with a pattern, the profile of the bag fitting into the pattern engraved on the jaw face. With this type of press it is impossible to secure an even pressure on the bag unless special jaws are made for each type, size and shape of bag.

It is an object of the present invention to provide a heated jaw for a press capable of exerting a substantially equal pressure on the whole of any surface having minor irregularity of form.

This result is achieved through use of the principle of rubber hydraulics; this is, a block of rubber will behave like a fluid for small displacements, so that an enclosed rubber block will exert a substantially equal pressure over its entire surface when deformed by the application of a locally increased pressure. With heat sealing the further problem arises that the rubber block must not be sub-

jected to much heating if rapid deterioration is to be avoided.

According to the present invention a press jaw comprises in combination a casing enclosing at one end a block of rubber or like material, a first set of equal length blades butting against said block of rubber or like material a second set of equal length blades adapted to butt at one end against said first set, the other end of said second set of blades forming the operative face of the press jaw, means being provided for heating the blades of said second set, said second set of blades being adapted to be automatically separated from the blades of said first set when the jaw is not under pressure.

The blades of the second set may be formed with upwardly disposed projections to engage a spring pressed member so as to separate automatically the two sets when the jaw is not under pressure so that the rubber or like block is not subjected to undue heating. The heated blades may receive their heat by conduction through the casing from electric heating elements attached to the outer surface of the case.

One embodiment of the present invention particularly adapted for a press for heat sealing paper bags and the like is described with reference to the accompanying drawings, in which:—

Fig. 1 shows a plan view of a press for heat sealing gusseted paper bags, when the jaws are open.

Fig. 2 shows a plan view when the jaws are closed.

Fig. 3 shows a side elevation with the jaws open.

Fig. 4 shows a side elevation, in section, with the jaws closed.

In this embodiment, a press for the heat sealing of paper bags and the like is constructed with a plain heatable jaw 1, which is shown diagrammatically and a jaw capable of exerting a substantially equal pressure over a surface having minor irregularities of form, hereinafter called the variable jaw.

The variable jaw comprises a casing, consisting of a steel end plate 2 and sides 4 built up of laminae of steel plates and sheets of insulating material. The casing is divided into a forward case and rear case by being so constructed that the top and bottom are discontinuous. The rear case is completed by flanged gun metal castings 5, bolted to the sides 4 and end plate 2. In the rear case a set of thin metal blades 7 are so positioned that they are a sliding fit in the case and butt against a rubber or like pad 8, which is positioned at the rear end

against the end plate 2 of the casing and which closes the end of the rear case; the blades 7 are thus encased on five sides.

The thin metal blades 7 are positioned by a retaining rod 9 fixed in the sides 4 which passes through a longitudinal slot 11 formed in the blades 7, thus permitting a limited longitudinal movement to the blades 7 individually relative to each other. A forward case is formed separate from the rear case by flanged gun metal castings 12, of which the rear flange is spaced apart from the front edge of the casting 5, so as to leave a slot. The forward case contains a second set of blades 14, all of equal length, the forward end of which act as the operative face of the jaw and the other end of which are adapted to abut against the forward end of the blades 7 contained in the rear case when the press is in use.

The set of blades 14 are formed with a shoulder 15, which provides a means of limiting the longitudinal movement of the blades 14. The forward movement of the blades is limited by the rear flange on the castings 12. Guide rods 16, threaded at both ends are fixed in the rear flange of the castings 12. A retainer 17 is slidably mounted on the guide rods

Compression springs 19 are located between the retainer 17 and adjusting bolts at the end of the guides 16 and cause the retainer 17 to press against the shoulders 15 on the blades 14, thus separating the forward and rear sets of blades automatically when the jaw is not under pressure. This prevents a loss of heat by conduction from the forward set of blades 14 to the rear set of blades 7, thus also preventing undue transmission of heat to the rubber or like pad 8.

On the outside of the castings 12 are attached the electric heating elements 21. The blades 14 are in sliding contact with the castings 12 and are heated by conduction through the castings 12. It will be obvious that each of the blades 14 will be equally heated in any position within the limits of movement allowed.

The operation of the press depends on the principle known as rubber hydraulics; that is, for very small linear displacements, rubber will act substantially as a fluid.

In operation the bag 25, which is to be heat sealed, is placed between the jaws of the press, which are then brought together. As the plain jaw 1 and the variable jaw come into contact with the bag the blades 14 conform to the contour of the bag; those plates which are in contact with the thickest portions of the bag receiving the largest displacements.

Further relative movement of the jaws forces the blades 14 into contact with the blades 7 which abut against the rubber or like pad 8.

5 These blades which have received the largest displacement come into contact with the rubber first. Owing to the plasticity of the rubber the blades 7 force the surface of the rubber backward and, 10 being encased, the displaced rubber exudes round the edges of the blades and comes into contact with and causes a pressure on the ends of the blades, which have received a lesser displacement. In 15 this way a substantially uniform pressure is exerted on each of the blades and thus transmitted to the face of the variable jaw to equalise the pressure at all parts of the operative face.

20 On releasing the pressure the blades 14 are separated from the blades 7 automatically by the action of the springs 19 and the retainer 17.

25 In other forms of this type of heat sealing press jaw the laminations may be heated by elements incorporated within the forward set of blades.

30 In this way a jaw is provided which is suitable for heat sealing paper bags and the like having varying sizes and thicknesses.

35 Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. A press jaw comprising in combination a casing enclosing at one end a

block of rubber or like material, a first set of equal length blades butting 40 against said block of rubber or like material, a second set of equal length blades, adapted at one end to butt against said first set, the other end of said second set of blades forming the opera- 45 tive face of the press jaw, means being provided for heating the blades of said second set, said second set of blades being adapted to be automatically separated from the blades of said first set when the 50 jaw is not under pressure.

2. A press jaw according to claim 1 wherein the blades of said second set are longitudinally slidable in said casing and are heated by conduction from one or 55 more electric heating units attached to the casing.

3. A press jaw according to claim 1 or 2 wherein means are provided for limiting the longitudinal movement of the blades 60 of both sets.

4. A press jaw according to any of claims 1 to 3 wherein the heated blades are formed with projections, adapted to be engaged by a spring pressed longitudinally movable member so as to move 65 said blades away from said first set of blades when said jaw is not under pressure.

5. A jaw substantially as illustrated in the accompanying drawings and described with reference thereto. 70

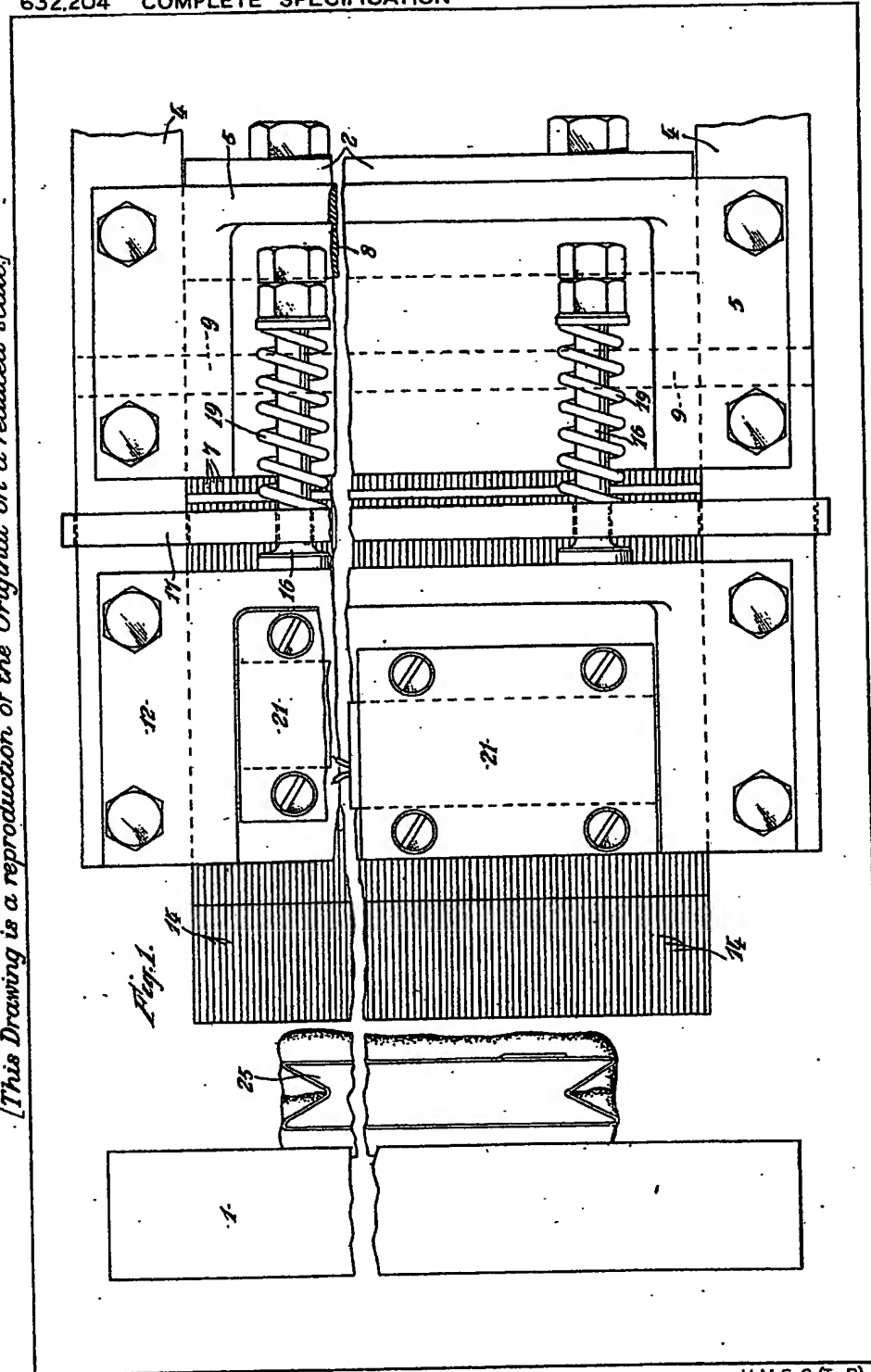
Dated this 30th day of January, 1948.

MEWBURN, ELLIS & CO.,
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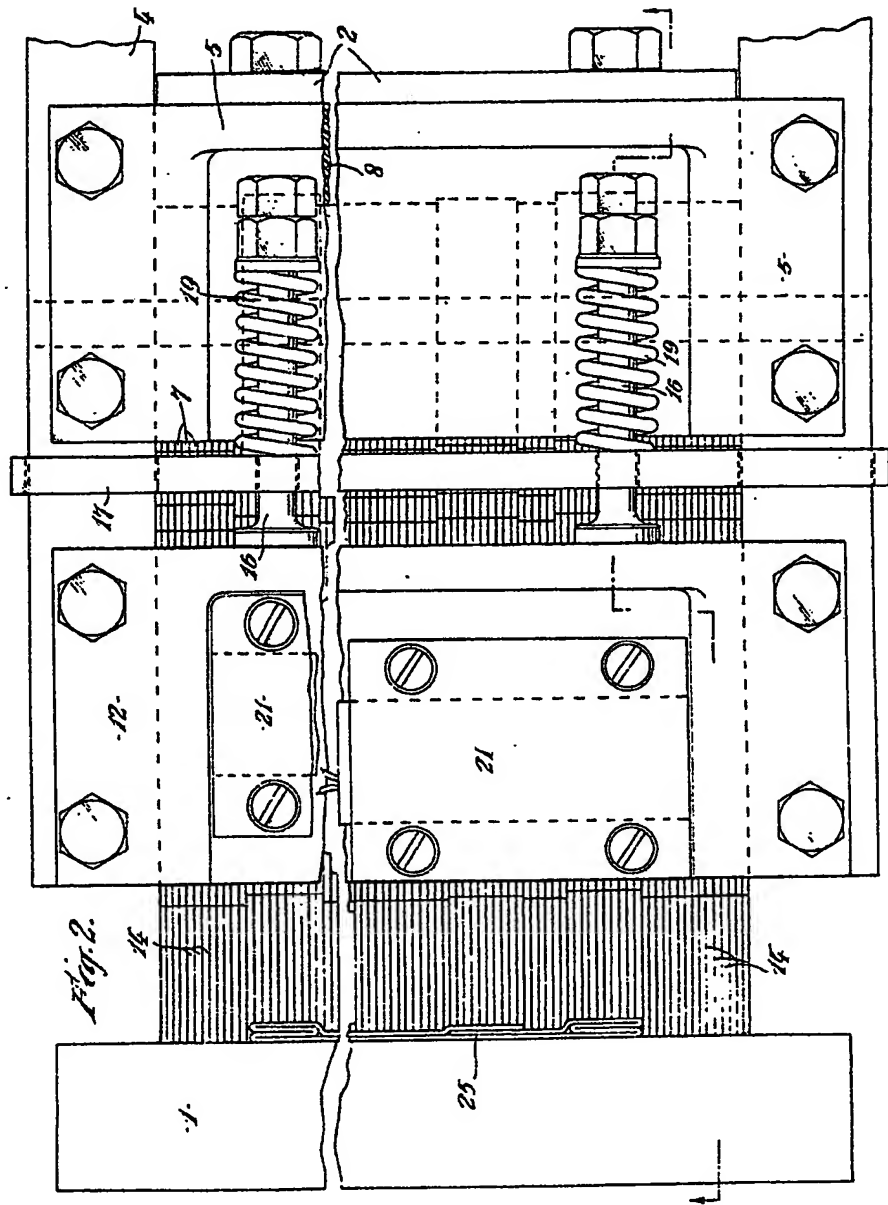
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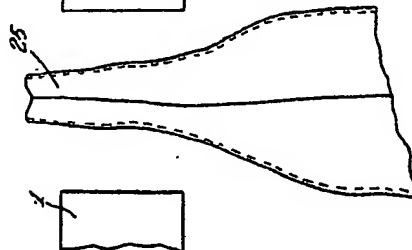
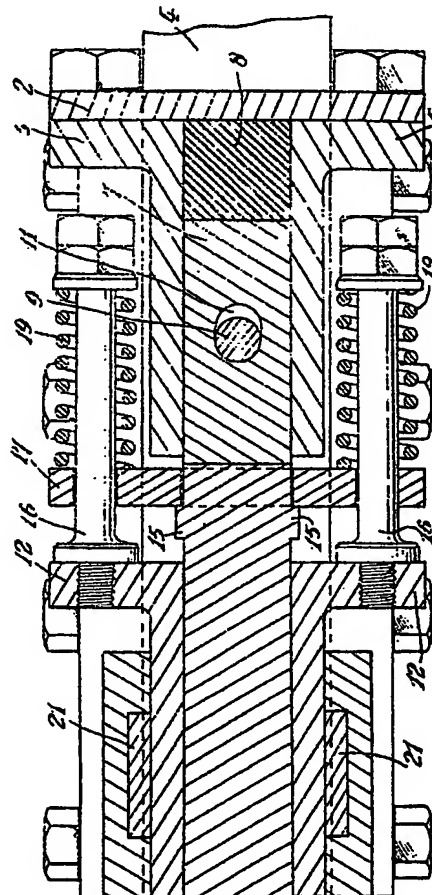
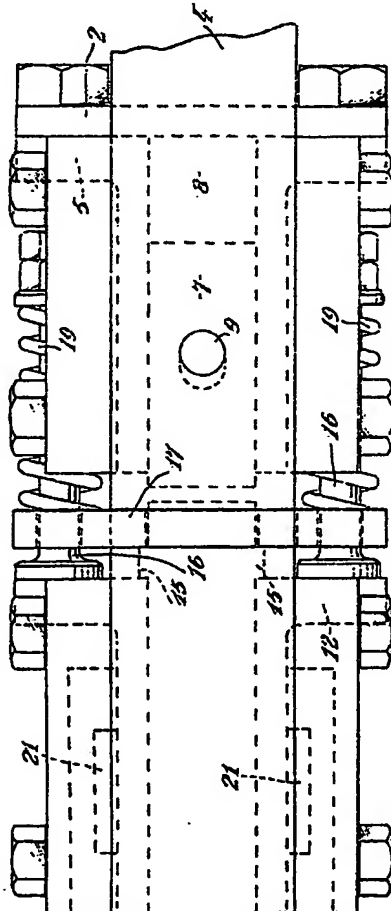
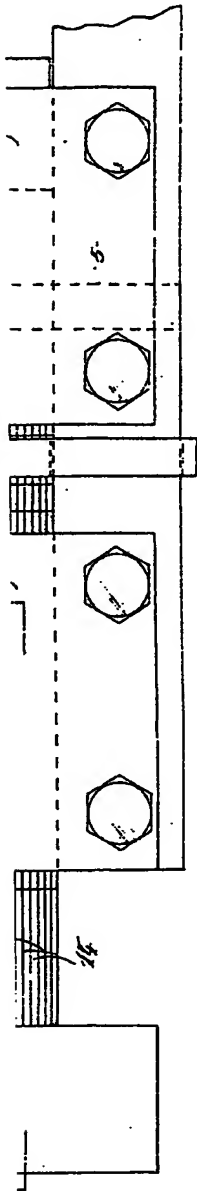
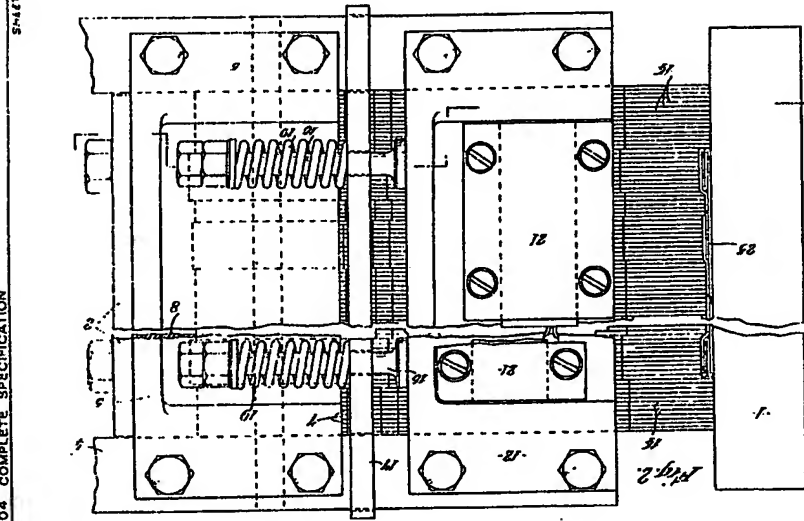
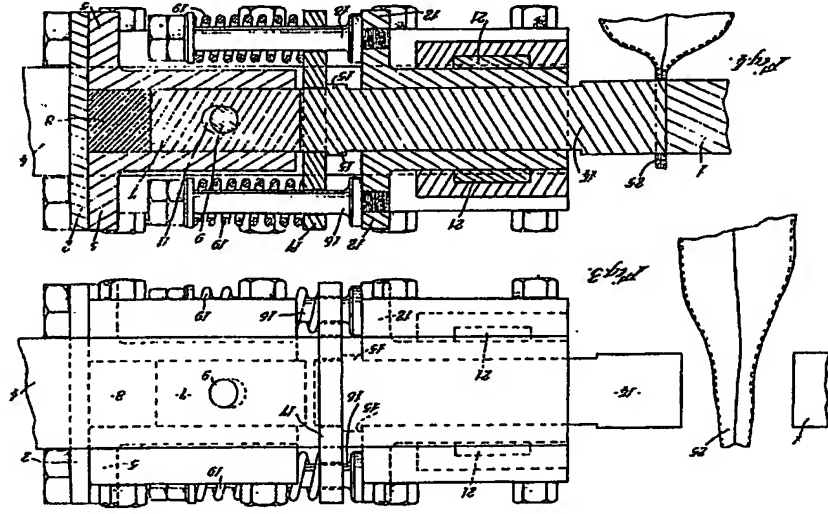


Fig. 3.

Fig. 4.



[This Drawing is a reproduction of the Original on a reduced scale]

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